Dugas (L. A.)

REMARKS

UPON

FRACTURES OF THE SCAPULA,

WITH CASES PRESENTING STRIKING PECULIARITIES;

READ BEFORE THE

MEDICAL SOCIETY OF THE STATE OF GEORGIA,

AT THEIR ANNUAL MEETING IN AUGUSTA, APRIL 8TH, 1857.

BY L. A. DUGAS, M. D.,
PROFESSOR OF SURGERY IN THE MEDICAL COLLEGE OF GEORGIA.

AUGUSTA:
McCAFFERTY'S OFFICE—J. MORRIS, PRINTER,
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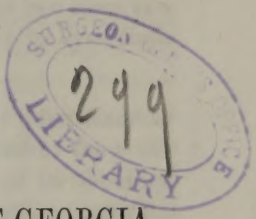

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FRACTURES OF THE SCAPULA.

The object of this paper is to take a hasty view of the injuries to which the Scapula may be subjected, to direct special attention to fractures of the Neck of this bone, and to relate two cases presenting important peculiarities hitherto unnoticed by systematic writers.

Fractures of the Scapula are comparatively rare: a fact that may be attributed alike to the security of its position and to the yielding nature of its attachments. In consequence of its mobility, shocks which might otherwise occasion serious fractures, are rarely followed by anything more than a contusion of the soft parts. A fracture of this bone may therefore be usually considered as indicative of a very considerable degree of violence.

The relative frequency of Fractures of the Scapula may perhaps be inferred from the statistics of Middlesex Hospital and of the Hotel-Dieu. In the former of these institutions, according to Lonsdale, out of nineteen hundred and one cases of Fracture there were eighteen of the Scapula, of which eight implicated the body, eight the acromion process, and two the neck of the bone. (Pirrie's Sys. of Surg., p. 146, Am. ed.) At the Hotel-Dieu there were but four Fractures of the Scapula in twenty-three hundred and fifty-eight cases. (Malgaigne. Tr. des Fract., &c., p. 498.) On the other hand, I have seen, in my private practice alone, four cases of Fracture of the Scapula, although the number of other fractures has not been unusually great.

Fractures of the Scapula may implicate the body of the bone, its spine, its processes, or its neck. Let us study them in each of these regions.

The *body of the scapula* may be fractured by violence directed against the back of the thorax, such as blows with a club or other heavy missiles, the kick of a horse, &c. I saw an accident of this kind resulting from the fall of a portion of the plastering in the ceiling of a high-pitched apartment. The person was seated, and was probably leaning forward when the heavy mass fell upon the scapula. In another instance that came under my observation, the body of the scapula was fractured by the hoof of a horse in running over the man. In such cases the true nature of the injury is considerably masked by the violence done to the soft parts, which are necessarily very much contused, sometimes considerably ecchymosed, and soon become the seat of tumefaction and great soreness. The patient will soon find all attempts to use the arm attended with pain over the whole of the scapular region, and the careless observer might easily overlook the deep-seated injury. But if the surgeon will place the fingers of one hand upon the inferior angle of the bone so as to fix it against the thorax, while he seizes the shoulder with the other hand and imparts motion in various directions to the humeral portion of the scapula, crepitation may be detected more or less distinctly. This may sometimes be facilitated by elevating the humerus at the same time. In the first case to which I just referred as having come under my observation, the patient would herself occasionally feel the crepitation on endeavoring to carry the elbow upwards or backwards, and would compare the sensation to that which might be occasioned by one edge of the bone slipping over the other. Under such circumstances, the hand of the surgeon applied flatly upon the scapula, would enable him to perceive the crepitus. By causing the patient to fold his arms across his breast, the scapula becomes more prominent, its general shape may be better defined, and the surgeon may, by measuring its diameters, establish a comparison with that of the uninjured side. Malgaigne (Tom. 1, p. 502) advises the forearm to be flexed and the hand to be carried forcibly back of the thorax, for the purpose of rendering the scapula more prominent, and consequently thus to facilitate its inspection. It must be confessed, however, that although the judicious surgeon will rarely fail to detect the existence of a fracture of the body of the scapula, it is always difficult and often impossible for him to determine the precise locality, shape, and extent of the injury.

The muscular masses between which the body of the scapula lies will usually prevent much displacement of the fragments, unless the inferior angle of the bone be alone separated, in which case the displacement is sometimes very marked. There are, however, some cases cited by Malgaigne and by Lonsdale in which the displacement of the fragments was very remarkable. In these cases the fractures were below the spine and in the long diameter of the bone, so that the action of the Teres major may have caused the displacement of the lower fragment. But this state of things may also be attributable to the combined influence of a laceration of the muscular layers and of the inefficiency of the retentive means subsequently used in the treatment.

In the *treatment* of these fractures, attention should be directed to the injury of the soft parts, as well as to the solution of osseous continuity. There may be a laceration of the skin alone, or of this and the muscles, down to the bone, thus constituting a compound fracture; or the contusion may have affected the tissues so seriously as to be followed by suppurative inflammation. If there be a compound fracture the wound should be carefully explored, and any detached fragment of bone immediately removed. The edges of the wound should then be approximated by means of adhesive plaster, taking care, in bad cases, to place a small tent in the wound for the escape of any pus that may be formed. In short, this should be treated upon the general principles applicable to other compound fractures. If the laceration does not expose the bone, the case will be managed as other lacerated wounds: by adhesive plasters and cold water dressings. In cases attended with mere contusion, the application of cold water, or of evaporating lotions, will usually suffice to abate the tendency to inflammation. Leeching may sometimes become necessary. Should suppuration ensue, an exit should be made for the pus as early as possible, in order to prevent its diffusion between the muscles.

At the same time that treatment is being thus directed to the soft parts, measures should be taken to maintain the fragments in their proper position and to prevent any motion between them. Many plans, more or less complicated, have been devised for this purpose. The simplest will, however, be found to be the most comfortable to the patient, and probably as effectual as any other. I would therefore, with many of the best authorities, advise a

sling to be placed under the elbow in such a manner as to bring this close to the chest and slightly forwards, at the same time that the force be so directed as to carry the shoulder upwards and a little outwards. By attaching to the ends of the sling slips of bandage, these may be carried around the thorax and arm so as to prevent any motion of the limb. This apparatus is much the same as that I usually apply for fractures of the clavicle, with the single exception that the elbow should not be carried so far forwards in fractures of the scapula.

Fractures of the *spine of the scapula* may accompany those of the body of the bone, or may exist independently of these. Malgaigne (T. 1, p. 499) says, that he knows of no instance in which the spine alone has been broken. Yet they are mentioned by Paulus Egineta, Ambrose Paré, and modern writers of distinction. By endeavoring to fix the scapula while motion is imparted to the spine through the acromion process, or by more direct manipulation, crepitation may be usually produced. In some cases the prominence of the spine will be diminished more or less considerably; but the tumefaction, which soon ensues, may prevent this from being apparent. I need scarcely add, that the *treatment* of such cases should be similar to that recommended for fractures of the body of the bone, properly so called.

Fractures of the Acromion Process.—The acromion is generally thought to be more frequently broken than any other portion of the scapula. Such is not the result of my observation, for out of the four cases of fracture of this bone which I have seen in my private practice, this process was found to be broken only once. According to the statistics above referred to, the acromion was fractured in eight out of eighteen cases of injury of the scapula. Malgaigne thinks the accident not so common as fractures of the body of the scapula. Yet, from its superficial and exposed position, it would seem to be natural that it should be more frequently injured than any other portion of the bone.

The acromion may be fractured at any point, from its extremity to its connexion with the spine of the scapula; and although the fracture is usually transverse, it may be more or less oblique. The extent of displacement will vary according to the seat and completeness of the fracture. If this be near the extremity, and especially if the periosteum be but slightly torn, there may be very

little displacement, and the diagnosis will be correspondingly obscure. The difficulty will be increased by tumefaction, and if the patient be fleshy. But when the solution of continuity involves a larger portion of the process, and the periosteum is completely divided, the fragment will be drawn down by the weight of the arm, there will be an obvious drooping of the shoulder, and the finger carried along the upper border of the acromion will more or less readily detect the displacement and seat of fracture. The depression of the shoulder, which might at first induce the suspicion of a dislocation of the humerus, can be easily overcome by pushing up the elbow, and is again reproduced by allowing the arm to hang down. Crepitation may be detected by the fingers placed upon the shoulder while the humerus is alternately forced up and down from the elbow, or carried horizontally, or rotated, as circumstances may require, so as to rub the fractured edges together.

The patient usually complains of the dragging weight of his arm, and of soreness and pain in the affected region, which are increased by efforts to elevate the arm. The inability of the patient to carry the hand to the head, or even to elevate the arm to a less degree, will necessarily be more or less marked, according to the seat and extent of injury to the bone, as well as of the contusion of the soft parts. Indeed, a mere contusion of the deltoid may render these movements very painful, or impossible, in some cases, and thus mislead the careless observer. The only reliable symptoms are the unevenness of the upper border of the acromion, the mobility of the fragment, and crepitation.

The injury may coincide with a dislocation of the acromial extremity of the clavicle, or with a fracture of this bone also. This complication will not materially obscure the diagnosis, unless the detection of the accident to the clavicle be calculated to throw the surgeon off his guard and to induce a neglect of the proper examination of the acromion itself. It is only in this way that we can explain the unfortunate errors recorded by Sir Astley Cooper and others.

It is generally conceded, that although a fracture of the acromion may be united by bone, it more frequently happens that the bond of union is fibrous. Malgaigne thinks the osseous union more probable, when the periosteum is but little torn and the displacement

consequently slight, than in cases in which there is a complete solution of continuity in the periosteum and considerable separation of the fragment.

Some deformity may therefore remain under the best management, and with or without impairment of motion and power in the limb. The danger of such results will, of course, be much increased by any negligence on the part of the patient in seconding the efforts of the surgeon.

Treatment.—In the management of this fracture, to use the language of Sir A. Cooper, "the head of the os humeri is the splint which is employed to keep the acromion in its natural situation." This distinguished surgeon advises the elbow to be maintained at a little distance from the thorax, by means of a cushion placed between it and the side, at the same time that it is carried a little backward and pressed upward by a roller-bandage. In this manner the deltoid is somewhat relaxed, and the head of the humerus keeps the fragment properly elevated. He objects, I think very properly, to the axillary pad recommended by some. I would prefer the sling bandage I am in the habit of using in fractures of the clavicle. (See Southern Med. and Surg. Jour., for 1852, p. 69.) This consists of a triangular bit of shirting, with three or four yards of three inch roller-bandage sewed on to each of the acute angles of the cloth. The elbow being placed in the position above indicated, with a cushion between it and the side, in these cases is then, by means of the sling carried under it, pressed upwards with the force requisite to restore the fragment of the acromion to its proper place; and the limb is secured in this position by carrying the ends of the sling above and below the opposite shoulder, and the rollers around the thorax, including the fore-arm.

A strip of adhesive plaster carried over the acromion is suggested by Dr. Brinton (Erichsen's Surgery, p. 207) as calculated to assist in retaining the fragments in apposition. A mould might be made with softened paste-board, or strips of linen coated with starch, to cover the deltoid muscle, and thus to furnish a medium of resistance to the upward pressure of the humerus, which would effectually prevent any displacement of the fracture by the means used to keep up the shoulder.

Malgaigne, who seems to give the preference to an ordinary sling with a roller-bandage to fix the limb against the chest, adds:

"if, however, in certain cases it be found that the complete reduction can be better effected by carrying the elbow outwards, backwards, or in any other direction, such means of retention should be adopted as will most effectually accomplish the object." The treatment should be continued about one month.

Fractures of the Coracoid Process.—From the deep-seated position of this process and its protection by muscular masses, in addition to the mobility of the scapula, its fracture is exceedingly rare, and almost always attended with a very considerable degree of contusion. Although few of the systematic writers seem to appreciate the danger of such an accident, history teaches us that it not unfrequently proves fatal. Boyer, Malgaigne, South, Arnott and others, relate cases in which the patients succumbed under the influence of extensive suppurative inflammation beneath the pectoral muscles and in the axillary region; some in very few days—others after more protracted suffering.

The *diagnosis* of these fractures is not always easily made out. But, in addition to the local pain, we may expect to find the fragment drawn down by the coraco-brachialis and other muscles implanted into this process, unless it be still held up by its ligamentous connexions with the clavicle and acromion, in which case crepitation could be more easily produced than if the separation were considerable. Unless the tumefaction be great, the situation of the fragment may sometimes be distinctly felt by fixing the scapula against the body and carrying the elbow in different directions. We may in the same way sometimes detect crepitation.

Treatment.—By placing the fore-arm in a sling, with the elbow inclined forward, so as to relax the biceps, coraco-brachialis and pectoralis minor, we shall accomplish all that can be done by mechanical means. But the treatment should also be specially directed to the prevention of suppurative inflammation. Cold water dressings and evaporating lotions should be diligently applied for at least ten days, or until the danger has subsided. Leeches may be sometimes advantageously applied. If suppuration takes place an early outlet should be made at the most dependent point.

It is doubted, by many, that ossific union ever takes place in this fracture. Yet, if the ligamentous attachments be unbroken,

the displacement will not probably be great, and we see no good reason why a bony union may not occur. The degree of disability consequent upon this accident will depend upon the firmness of the adhesions the fragment may form.

Fractures of the Neck of the Scapula.—The written history of this accident offers a singular illustration of the defects of anatomical language, and of the evil of using terms whose meaning is liable to various interpretations. When *anatomists* use the expression *cervix-scapulæ*, or *neck of the scapula*, they apply it to a line near the circumference of the glenoid cavity and just beyond the attachment of the capsular ligament. This line does not, therefore, include the coracoid process. But *surgical* writers apply these terms indifferently to the line just indicated and to another, which, commencing at the notch in the superior costa of the scapula, would follow the depression at the anterior termination of the spine, and, running around this narrow portion of the bone, would include the whole of the enlargement which supports the glenoid cavity and the root of the coracoid process. In short, there is here the same want of precision that we find with regard to the neck of the humerus. In both cases anatomists regard the line of junction of the articular surface, or epiphysis with the body of the bone, as *the neck*, while surgeons are in the habit of including within the neck a much larger portion of the bone. Hence the epithets *anatomical neck* and *surgical neck*, used by writers who do not wish to be misunderstood.

I am led to make these remarks, in consequence of an apparent discrepancy between authors of acknowledged ability and experience. Sir A. Cooper, in his admirable work upon Dislocations and Fractures, devotes a special and entire section to "Fractures of the Neck of the Scapula," and relates three cases in illustration of his views. But he sets out with the following declaration:—"When I speak of fracture of the cervix scapulæ, I mean a fracture through the narrow part of the bone, immediately opposite the notch of the superior costa." There can be no mistake then as to his true meaning. Now let us refer to Prof. Erichsen, and we find only this short paragraph on the subject:

"Fracture of the neck of the scapula probably never occurs, and there can be little doubt that Sir A. Cooper and Mr. South are correct in stating that cases so described are in reality instances of

fracture of the upper end of the humerus. There is, according to Mr. South, no preparation in any museum in London illustrating fracture of the neck of the scapula. Indeed, on looking at the great strength of this portion of the bone, and the way in which it is protected by the other parts about the shoulder, it is difficult to understand how it can be broken." Prof. Erichsen does not any where indicate what he means by "the neck," and would seem, from the above quotation, to have committed a singular error in relation to Sir A. Cooper's views. But Dr. Brinton, the American Editor of Prof. E.'s work, without remarking upon this error, adds: "A number of cases of fracture of the neck of the scapula have been reported; in all instances, however, the line of fracture passing behind the base of the coracoid process. (The Science and Art of Surgery, Am. Ed., p. 207–8.) It appears to me very evident that Prof. Erichsen has been misled by the Notes appended by Mr. South to the Translation of Chelius. (See the Am. Ed. of Chelius, vol. 1, p. 601, and p. 606.)

Now the question presents itself: is there ever any fracture of either the *anatomical* or the *surgical* neck of the scapula?

In reference to the occurrence of fractures of the *anatomical* neck of the scapula, I find that the celebrated Jean Louis Petit observes: "Le col de l'omoplate ne peut se casser que très difficilement . . . cependant je l'ai vû cassé près du bord de la cavité: on le réduisit facilement, mais on eut beaucoup de peine à le contenir, et le malade est demeuré estropié." (Traité des Mal. des os. Paris, 1758. Tom. 2, p. 136.)

"The neck of the scapula is not broken without great difficulty. . . . Yet I have seen it broken near the edge of the glenoid cavity: it was easily reduced, but very difficult to keep in place, and the patient remained crippled."

In Bell's Anatomy (Am. Ed., vol. 1, p. 78) is the following language: "This head, or glenoid cavity of the scapula, is planted upon a narrower part, which tends to a point, but is finished by this flat head; this narrower part is what is named the *Neck* of the *scapula*, which, no doubt, sometimes gives way and breaks." In a foot-note, he adds: "I have met with the accident in practice, and have preparations of the fractured bone, so that there can be no doubt of this accident sometimes occurring, yet it is very rare."

Samuel Cooper says that "sometimes great pains and a crepitus are experienced on moving the shoulder-joint after an accident; and yet the spine, the neck of the scapula" (the surgical neck), "and all the above parts, are not broken. In this circumstance, it is to be suspected either that a small portion of the head of the os brachii, or a little piece of the *glenoid cavity* of the scapula, is broken off; which latter occurrence, I think, is not very uncommon." (Dict. of Pract. Surgery.)

Chelius treats of fractures of the neck of the shoulder blade, but I cannot determine whether he alludes to the anatomical or the surgical neck. Vidal evidently speaks of a fracture of the *anatomical* neck, when he tells us that if the neck of the scapula be broken the glenoidal fragment will be drawn down by the long head of the biceps. He refers to the action of none of the muscles implanted into the coracoid process. (Tr. de Pathol. Ext., Tom. 2, p. 224.) Fergusson teaches that the glenoid cavity may be separated from the body of the scapula, at either the surgical or the anatomical neck and says that he thinks he has seen an instance of the latter kind. (Op. cit., p. 212.) He even illustrates his position by a wood-cut, which is, however, evidently not copied from nature.

While it is very evident from these quotations that some practitioners not only believe in the *possibility* of a fracture of the anatomical neck of the scapula, but also think that they have *seen* cases of this accident, their language is not such as to remove all doubt as to their true meaning in those cases in which they refer to actual specimens examined after death. J. L. Petit thinks he treated a case of fracture near the glenoid cavity—but he made no post-mortem inspection, and may therefore have been mistaken. John Bell's language is too ambiguous to authorize us to conclude positively that his specimen was one of this kind. Samuel Cooper, Chelius, Vidal, and Fergusson, have neither of them referred to any specimen, but simply believe that this fracture has occurred. I do not recollect ever seeing a specimen of this kind, and know of no author who unequivocally describes any. We may therefore reasonably infer that if it does ever take place, it must be exceedingly rare.

Let us now advert to the evidence in regard to fractures of the *surgical* neck of the scapula. We have already seen that Sir Astley

Cooper not only admits its existence, but even adduces the history of three cases of the kind. We have likewise quoted Dr. Brinton on the subject. Prof. Pirrie, after defining the surgical neck, and referring to the doubts of some as to the possibility of its fracture, adds: "Its occurrence has now been proved by dissection. I have seen three examples of this fracture. One was in a woman upwards of forty-five years of age; another, in a man upwards of fifty; and a third, in a lad of sixteen." (Princ. and Pract. of Surgery, Am. Ed. p. 149.) Samuel Cooper admits its occurrence, in his Dictionary of Practical Surgery. It is somewhat remarkable that Malgaigne, in his elaborate work upon Fractures, makes no allusion whatever, to fractures of the neck of the scapula, either anatomical or surgical. Fractures of the surgical neck are distinctly described by Druitt, Fergusson, Prof. Miller of Edinburgh, and others. It is unnecessary to furnish any farther testimony to prove that this fracture may occur, and that it has been studied. But we cannot refrain from reproducing the graphic histories left us by such authority as Sir Astley Cooper.

"Case CCXLIII.—Mrs. R. in February, 1834, was thrown from a gig by the wheel running upon a bank. She was stunned by the fall, and remained insensible some little time; she then found that her head, shoulder, hip, and ankle, on the right side, were much bruised, so much so that she was unable to move either of them, from pain and swelling; the chief bruise on the shoulder was at the upper and back part. Thinking that the stiffness of the shoulder, as well as of the hip and ankle, arose merely from the bruise, no surgeon saw her until ten days after the accident, when she found that notwithstanding the swelling had subsided, she was unable to move her arm. The surgeon, mistaking the case for dislocation, placed his knee in the axilla, and made violent extension; finding, however, that upon removing the knee, the shoulder again assumed its original flattened appearance, he said that there was a fracture somewhere, but could not say exactly at what part; he then placed a pad in the axilla, and put on a figure-of-8 bandage, confining the arm to the side by another bandage. Swelling and inflammation about the shoulder-joint followed the use of the extending force, to such an extent as to render the removal of the bandage immediately necessary. Leeches, cold lotions, and strict antiphlogistic regimen reduced this, and in a week or ten days the bandages were again applied, and continued for six weeks, being renewed several times during that period. At the end of this time all the bandages were removed, and the patient desired gradually to use the arm as much

as she was able; she could not, however, use it in the slightest degree, and even the passive motion made use of, greatly increased her suffering, and produced several attacks of inflammation of the part. These were reduced as before, and she continued the passive motion, under the direction of her surgeon, (notwithstanding that it much increased her suffering) until July, when the pain which the slightest motion gave her had increased to such an extent that she could bear it no longer. In the commencement of August, at the request of her brother, she came to town for further advice, when the state of the case was as follows.

"The right shoulder was flattened, the arm dropped, the coracoid process of the affected side was on a plane nearly an inch lower than the opposite, the head of the bone and edge of the glenoid cavity might be felt in the axilla, and by placing the finger upon the under edge of that cavity, and raising it, the whole arm was reduced to its natural appearance, and at the same time a distinct crepitus was felt. There was some deformity at the top of the shoulder, however still remaining, from the clavicle having been fractured close to its acromial extremity, and from its having united without being reduced; it was the acromial portion which in this case rode over the end of the sternal. A crepitus was also distinctly felt, by placing the fore and middle finger upon the coracoid process, and the thumb on the back part of the shoulder, and thus moving the glenoid cavity from side to side, marking the case clearly to be one of non-united fracture of the cervix of the scapula.

"A thick cushion was therefore placed in the axilla, and the shoulder being raised to its natural position, a bandage was passed under the arm and over the shoulder, being at the same time passed once or twice around the chest to prevent its slipping off the shoulder.

"The arm was confined to the side, and the elbow supported by a pasteboard sling. In this way the patient was made comparatively easy, the natural roundness of the shoulder restored, and she was, enabled to turn and move in bed, which, before the shoulder was fixed, she was unable to do, from the great pain it occasioned.

"Case CCXLIV.—In the year 1829, I was consulted by Mr. Alderman Partridge, of Colchester, respecting a case of this accident, which he described in the following words:

"'Mr. P., of Colchester, met with an accident about five months since by a fall from his chaise. I was requested to meet Dr. Nunn, who had been in attendance for two or three days; and it then appeared to have been a dislocation of the humerus into the axilla, and I could see no reason to doubt but that Dr. Nunn had reduced it; but I must confess that the tumefaction and tension were so considerable, that it became a difficult matter to decide: however, both from what he himself stated at the time, as well as from Dr.

Nunn's and my own personal observation. I gave it as my opinion that it was reduced, although that shoulder appeared rather lower than the other. This I had observed in other cases; but in this instance it struck me to be rather more than common, and led me to conclude (which I stated at the time,) that a considerable portion of the glenoid cavity had been fractured off. I saw him several times afterwards; and although the swelling continued for several weeks, still it became more and more observable that some very serious injury had been done to the glenoid cavity; and when I saw him at about a month or six weeks from the accident, I could, by placing my hand in the axilla, and pushing at the elbow, bring the head of the humerus up and rotate it in the glenoid cavity; and still persisted in my former opinion. I was again requested to see him about a week since, when I found the head of the bone resting, where you will, I doubt not, find it; and conveying to the feel a certain crepitus, which still leads me to suppose that the glenoid cavity has received the injury I have described, and how far the chances go for any benefit by an effort to replace it after such a lapse of time I must leave to you.'

"The degree of deformity produced by this accident depends upon the extent of laceration of a ligament which passes from the under part of the spine of the scapula to the glenoid cavity, and which is not generally described in anatomical books. If this be torn, the glenoid cavity and the head of the os humeri fall deeply into the axilla; but the displacement is much less if this remain whole

"Case CCXLV.—A young lady was thrown from a gig, by the fall of the horse, in the Strand; and being carried to her house, a surgeon in the neighborhood was sent for, who told her the shoulder was dislocated; by extension all the appearances of dislocation were removed, and he bound up the arm. On the following morning he requested me to see the case, as the arm, he said, was again dislocated. On examination, I found the head of the bone in the axilla, and the shoulder so fallen and flattened, as to give to the accident many of the characters of dislocation; however by elevating the shoulder, and by raising the arm at the elbow, and the head of the bone from the axilla, it was immediately replaced; but when I gave up this support the limb instantly sunk again. I then rotated the elbow, and pressing the coracoid process of the scapula with my fingers, by grasping the top of the shoulder, directly felt a crepitus. Having satisfactorily ascertained the nature of the accident, I placed a thick cushion in the axilla, and drawing the shoulder into its natural position, secured it by the application of a clavicle bandage, and in seven weeks the part united without deformity."

The symptomatology deducible from the above cases, is very

plain: the shoulder droops, and the deltoid is flattened in consequence of the falling of the head of the humerus which can be felt in the axilla; the coracoid process is lower than that of the other side; but the natural relation of the parts is readily restored by pushing up the humerus, and again as readily displaced by allowing the arm to hang down; crepitation may also be distinctly felt by imparting motion to the fragment, by means of the fingers applied to the coracoid process, while the body of the scapula is held firmly by the other hand resting upon it; or, it may be induced by simply pushing up the humerus and glenoid cavity to their proper position, and then rubbing the fragments together by varied movements. In the language of Sir Astley Cooper, "the diagnostic marks of this accident are three; first, the facility with which the parts are replaced; secondly, the immediate fall of the head of the bone into the axilla, when the extension (elevation?) is removed; and thirdly, the crepitus which is felt at the extremity of the coracoid process of the scapula, when the arm is rotated. The best method of discovering the crepitus is, for the surgeon's hand to be placed over the top of the shoulder, and the point of the fore-finger to be rested on the coracoid process; the arm being then rotated, the crepitus is directly perceived, because the coracoid process being attached to the glenoid cavity, and being broken off with it, although itself uninjured, the crepitus is communicated through the medium of that process." (Page 370.)

I will now proceed to give an account of two cases of this fracture which have come under my personal observation:

Case I.—On the 7th of October, 1853, a stout negro man, about nineteen years of age, called Ambrose, and belonging to Mr. Avery, of Columbia county, Ga., was sent to me with a note from my friend Dr. H. R. Casey, who had seen the case. It seems that three weeks previously, while at work in the field, a limb fell from a tree upon the left shoulder of this man. The blow was very severe, and, upon recovering from the shock, the man found that he had entirely lost the use of his arm, but suffered excruciating pain in the shoulder, axilla, and even to the ends of his fingers. The Doctor saw him a few hours after the accident, and found him still suffering intensely and unable to move any portion of the limb; not even the fingers. No arterial pulsation whatever

could be felt at the wrist, the limb was rather cool, but sensibility was not destroyed in it, for the patient would feel when pinched. There were no symptoms of concussion of the brain nor of any lesion about the head. The shoulder alone had been stricken, and this was very much swollen. Opiates were freely administered to relieve the pain, and the limb was placed in a sling.

The following copy of a letter, written to Dr. C., will explain the condition in which I found the patient:

AUGUSTA, 7th October, 1853.

Dear Doctor,

I have carefully examined the very interesting case sent me by Mr. A., and think that the paralysis was induced by injury to the axillary nerves and vessels which were jammed against the ribs by the head of the humerus, when the blow was received. I think there is a fracture of the neck of the scapula still existing.

I will briefly enumerate the symptoms I have observed: evident depression of the head of the humerus below the acromion; the head of the humerus rotates under the finger continuously with the lower end of the bone, and without crepitation; the depression of the head of the humerus is reduced by pressing up the elbow; crepitation very audible, and easily felt by placing the left hand upon the shoulder, whilst with the right hand you seize the elbow and work it freely, so as to force the shoulder up and down. No crepitus can be induced by acting upon the different parts of the *body* of the scapula, nor upon the acromion, nor upon the clavicle. By placing your ear, with or without the stethoscope, upon the scapula, the crepitus is very loud. Now, as to the suspended circulation and paralysis, I find no pulsation in the arteries, not even as high as the axilla, although the brachial artery can be felt like a cord with its accompanying nerve on the inside of the biceps. The limb is cold, but especially so, below the elbow. Circulation in the veins evident, but slow. The limb is insensible below the elbow, and partially so above. The ulnar nerve may be compressed behind the elbow without sensation.

The patient says that he suffered dreadfully at first, and that the whole limb down to the ends of his fingers was much swollen, as

well as that side of the chest, for some time after the injury; and that loss of motion was immediately induced. From these facts, I think myself warranted in the inference above indicated, and also in the belief that the vessels have suffered so much from the contusion as to obliterate the axillary artery.

It is now three weeks since the accident—what is to be done? Suspend the elbow with a handkerchief sling, such as I advise in fractures of the clavicle, so as to keep the fractured edges in contact, and to relieve the axillary nerves from compression. Give electric shocks daily to the limb, passing the fluid from the back of the neck down to the fingers. This stimulation of the nerves may possibly be useful. Let the man take exercise to brace the system. Yours, in haste,

L. A. Dugas.

Wishing to know the present state of the case, I addressed a note to Dr. Casey, requesting him to see Ambrose, and to furnish me the desired information. I make the subjoined extract from the Doctor's reply, dated 31st March, 1857:

"I examined Ambrose with Dr. Baily to-day. We think that the coracoid process is not in its proper place, but below this and along with the glenoid cavity. The acromion is intact, and the head of the humerus can be readily felt rotating below. We thought we could detect a slight crepitus, but not very distinctly. The limb is very much atrophied—I should say not half as large as the other. The atrophy extends to the muscles on that side of the chest. The mammary region here is entirely shrunken, while it is very prominent on the other side. Paralysis still extends to the fingers. He still suffers pain occasionally."

Remarks.—I should here observe, that when I saw the patient, I could not feel the coracoid process with sufficient distinctness to act upon it as advised by Sir A. Cooper. Yet the whole chain of symptoms was sufficiently characteristic to leave no doubt as to the true nature of the case. The head of the humerus was depressed to such a degree, as to rest upon the axillary plexus, but could be easily forced up into its proper position; it rotated *continuously* with the shaft of the bone, and without crepitation; cre-

pitation was easily felt by forcing the elbow up and down so as to bring the fragments against each other. Neither the clavicle, the acromion, nor any portion of the *body* of the scapula was broken. The seat of fracture could only be in the surgical neck of the scapula.

The lesion of the axillary artery and nerves here noted deserves especial attention, for I am not aware that it has been mentioned by any author in connection with this accident. It is true, that some of them allude to the disability sometimes experienced in the use of the limb, and which may even lead to loss of motion in neglected cases; but, nowhere do I find any intimation of the sudden production of paralysis, nor of the obliteration of the artery so remarkable in this case, and so evidently caused by the immediate injury done to the nerves and blood-vessels of the axilla.

Baron Boyer, who is perhaps more full in the description of such accidents than any other writer, with the exception of Sir A. Cooper, observes: "But the most serious of all these fractures (fractures of the scapula), are those of the coracoid process and of the neck of the bone: these are difficult to keep in place, and their consolidation is frequently attended with considerable stiffness of the arm, with an impossibility to elevate the limb, with atrophy, and sometimes even with paralysis." (Translated from p. 166—Tom. 3—of Tr. des Med. Chir., Paris, 1831.) Boyer's remarks here evidently refer to the effects of continued disuse, rather than to any immediate injury to the nerves. The same may be said with regard to the views of Sir A. Cooper.

Case II.—In December last, (1856,) Mr. R. W. Daniel, of Jefferson county, in this State, brought to me a negro man between fifty and sixty years of age, who, in the month of March previous, while felling trees was stricken down by a limb. The blow was principally sustained by the right shoulder, and he immediately lost the use of his arm and fingers. The physician who saw him reports that no pulse could be felt at the wrist at his first visit. My examination of the case, nine months after the accident, revealed the following state of things:

The clavicle had been broken at about two and a half inches from its acromial extremity, but the fracture was united, the ster-

nal fragment overlapping the other. The acromion process had also been broken at its junction with the spine of the scapula, and an uneven union had taken place. The connection between the acromion and the clavicle appeared to have sustained some injury as it was enlarged and uneven. The shoulder drooped so much as to resemble very much at first sight a dislocation downwards. The deltoid was flattened, and the head of the humerus could not be found in its proper place, unless forced up by acting upon the elbow, by which means it could be readily replaced, but would again immediately fall upon releasing the elbow, and permitting the limb to hang down. The coracoid process evidently followed the upward and downward movements of the humerus. No crepitus could be detected by rotating the humerus when hanging down, but it became very audible when the elbow was forced up and then moved in different directions. The elbow could be placed against the chest while the fingers rested upon the sound shoulder, without any difficulty, so as to establish conclusively that there was no dislocation of the humerus, according to the principle I have established for some years back. (See Southern Med. and Surg. Jl. for 1856, p. 131.)

The patient still suffered almost continual pain along the arm down to the fingers. He represented his sufferings as sometimes excruciating. These were somewhat relieved by forcing up the head of the humerus. He was entirely unable to move any muscle from the shoulder down, and he said that his limb felt benumbed, especially from the elbow to his fingers. He could, however, feel when pinched at any point of the surface. No pulsation whatever could be felt in any of the arteries of the limb, and the temperature of the skin was lower than that of the other arm. The pectoralis major, the muscles of the scapula, those of the shoulder, and indeed of the whole limb were very much atrophied. The man's general health had suffered from long continued pain and want of accustomed active exercise.

The only prescription made in this case was, that the humerus should be well forced up and sustained in this position by means of a sling bandage carried beneath the elbow and well secured.

Dr. James Bell, who lives in the neighborhood, informs me in a letter, (dated 18th March, 1857,) that the patient has been using

the sling since I advised it, that the shoulder appears to be a little fuller, but that he still has no use of his limb, and occasionally suffers extreme pain in the wrist. His fingers are dwindling away and becoming stiff.

Remarks.—It will be observed that, with the exception of the fractures of the clavicle and acromion, this case presents a striking analogy to the one just preceding. In both cases the injury resulted from the fall of a tree, in both instances the blow was followed immediately by paralysis and cessation of circulation in the arterial trunks, and in both the injury to the nerves and blood-vessels has persisted. Both have derived some relief by the support given to the limb, but they still suffer more or less. In neither case was a retentive bandage applied soon enough to promise union of the fragments, and none has taken place. Both being ignorant and heedless negroes, have doubtless been more or less remiss in proper attentions to the application of the bandage, and this may account in some measure for the persistence of pain. Would a timely application of suitable bandages have allowed the nerves and vessels to recover from the severe injury inflicted upon them? The question cannot be satisfactorily answered without additional facts and observations.

The deplorable condition of these men, who have not only lost the use of an arm, but are also subject to harassing pains, which may continue indefinitely, would seem to demand at our hands some measure of relief. Unable to think of anything better, the propriety of amputation has presented itself to my mind as perhaps justifiable under the circumstances.

By removing the weight of the limb which is continually pressing upon and chafing the nerves, it is probable that the pains with which these patients are annoyed would cease. The usefulness of the limb being irrecoverably lost, the only objection to amputation, since it may be done without pain under the influence of anæsthesia, would be its danger to life. This danger would of course be greater in amputation at the shoulder joint, than if it were performed at the insertion of the deltoid muscle, and the latter would probably answer the indication. Amputations in the upper portion of the arm are so rarely fatal in this section of country that the patient might well take the risk for the relief, espe-

cially when we consider that the change from a life of laborious exercise to one of even painless inactivity is in itself not without danger. Under the influence of these considerations, I recently proposed amputation to Ambrose, who has now been suffering several years; but he objects to the experiment.